



2012-2013 District Nominee Presentation Form

PART I - ELIGIBILITY CERTIFICATION

District's Certifications

The signatures of the district superintendent (or equivalent) on the next page certifies that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the superintendent's knowledge.

1. The district has been evaluated and selected from among districts within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
2. The district is providing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review.
3. OCR has not issued a violation letter of findings to the school district concluding that the nominated school district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.
4. The U.S. Department of Justice does not have a pending suit alleging that the school district has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
5. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the school district in question; or if there are such findings, the state or school district has corrected, or agreed to correct, the findings.
6. The district meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.



U.S. Department of Education Green Ribbon Schools 2013 – District Award

Name of Superintendent* Dr. Stephen Mills
(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

District Name* Acton-Boxborough Regional School District & Acton Public Schools

Tel. (978) 264-4700

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.

Stephen Mills Date 4/6/13
(Superintendent's Signature)

PART II – SUMMARY OF ACHIEVEMENTS

Instructions to District Superintendent

Provide a concise and coherent "snapshot" that describes how your district is representative of your jurisdiction's highest achieving green school efforts in approximately 800 words. Summarize your strengths and accomplishments. Focus on what makes your district worthy of the U.S. Department of Education Green Ribbon School District Award.

SUMMARY OF ACHIEVEMENTS:

The Acton Public Schools and Acton-Boxborough Regional School District* have made a substantial commitment to progress in greening up our school district. We see significant benefits in lower operating expenses, reduced environmental impact, and an emphasis on healthy conditions in our schools. Most importantly, a focus on sustainability at the district level affords students the opportunity to engage with the natural world, to develop insights and skills as critical thinkers and to become productive citizens as they explore a range of essential related questions.

We have made marked reductions in energy consumption, including an 18% drop in electricity use over the last three years. The lion's share of this drop has been achieved through engaging faculty, staff and students in choosing and promoting energy-conserving behaviors. Students have been important participants contributing momentum and creativity, and have contributed leadership as well at the high school where they've launched Power Down initiatives and provided feedback about powering down for adult members of the community. These student initiatives have been recognized with international, national and state level awards. Faculty and staff have been responsive and positive about this heightened focus on energy conservation, and are appreciative of the opportunities afforded by the significant cost savings. Facilities staff members play a critical role in tightening operation schedules and implementing other energy conservation



measures. An Energy Advisor position created with grant money provides analysis and facilitation of energy efficiency initiatives, and is now established as a full-time district-funded position.

The district also reduced natural gas usage, creating a 22% drop in overall energy consumption (in part attributable to low natural gas usage during a mild 2011-2012 winter) and a 24% drop in CO₂ emissions. The additional margin of reduction in CO₂ emissions is due to the 280 kW of photovoltaic arrays operating on school roofs, which provide nearly 5% of our electricity supply. The district has also committed to purchasing 20% of our electricity from renewable sources with our most recent electricity contract. In addition, we are aggressively pursuing funding for mechanical energy efficiency projects, including state funding through the Green Communities program and utility incentives. Mechanical projects include lighting retrofits, an HVAC upgrade for our junior high school, and efficiency controls for our walk-in coolers/freezers. The school buildings are all benchmarked through EPA's Portfolio Manager, and four of the buildings recently qualified for Energy Star plaques!

Solid waste has also been reduced significantly with the introduction of single stream recycling. All schools have a recycling program with student teams involved in collection of materials. The high school cafeteria benefits from student-run sorting stations, cutting solid waste from 80% to 25% of the stream, and providing for 100% capture of recyclables and the capture of organics for composting. Water conservation is practiced district-wide, with a 20% drop in consumption following the installation of low-flow plumbing fixtures in 1998. Local tap water is actively promoted with bottle filling stations and student-made posters, and two large-scale rain gardens have recently been installed on the campus.

Procurement reflects the district's priority on sustainability as well. All desktops and work stations purchased since 2011 are EPEAT-certified, and all paper towels and toilet paper are Green Seal-certified. Food Services is actively researching supplies that will reduce the cafeteria solid waste stream, with assistance from high school student researchers. Cleaning supplies have been simplified to a small number of green-certified products, and stripping of floors has been eliminated as a routine practice, saving approximately 1,000 gallons of chemical wax stripper annually.

School buses are 2012 vehicles equipped with clean-burning technology, and are fueled with ultra-low sulfur diesel. In addition, the district has a no-idling procedure in place, and buses have a 5 minute mechanical cutoff to ensure no idling beyond that limit. Walking School Bus programs are active in two of our elementary schools, and we plan to support the expansion of this program.

The Food Services department participates in the Farm to School program, and there are three gardens producing vegetables and flowers at our schools! These gardens are incorporated into



student activities, and provide a source of inspiration for many. Our Food Services department was recently notified of their successful application to the USDA's Healthier US School Challenge program – all five elementary schools will be certified at either the Bronze or Silver level! Our excellent physical education program includes outdoor recreation for students as well as a focus on health education.

Any student with an asthma diagnosis has a health care plan including prevention and treatment overseen by our Health Services staff, and asthma triggers are minimized through management of building environments. The Facilities department maintains high standards in indoor air quality, integrated pest management, and control of moisture, chemicals and contaminants.

The district has had a significant commitment to Environmental Education for many years. This has expanded recently to include energy conservation, sustainability and service learning. Environmental Education curriculum in the district begins in pre-school and continues through advanced levels in high school classes and extra-curricular activities. Pre-school students explore nearby natural areas to learn about trees, birds and insects. They use recycled materials for projects and play outdoors on a daily basis, weather permitting. Elementary students continue those efforts and add energy conservation, ecosystems science courses, and service-oriented conservation/sustainability activities. In the junior high and high school, science classes continue preparing students to understand the complexities of the natural world. English classes introduce fiction and non-fiction texts which help students grapple with the complex issues of sustainability and environmental health. At this level, large numbers of students are involved in award-winning service-learning efforts to reduce energy use and create a healthier, more sustainable school environment.

*The Acton-Boxborough Regional School District (serving Grades 7-12) and the Acton Public Schools (serving PK-6) are two districts that work in close partnership and are referenced in this application as a single entity (ABRSD-APS). The Green Ribbon Schools application is submitted jointly on behalf of both organizations.

PART III – DOCUMENTATION OF STATE EVALUATION OF DISTRICT NOMINEE

Instructions to Nominating Authority

The Nominating Authority must document the district's high achievement in each of the three ED-GRS Pillars and nine Elements. Please attach documentation in each Pillar and Element. This may be the Authority's application based on the Framework and sample application or a committee's written evaluation of a school in each Pillar and Element.

Nominating Authority's Certifications



The signature by the Nominating Authority on this page certifies that each of the statements below concerning the district's eligibility and compliance with the following requirements is true and correct to the best of the Authority's knowledge.

1. The district is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
2. The district meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating
Agency

Massachusetts Department of Elementary
and Secondary Education

Name of Nominating
Authority

Michael D. Chester, Ed.D., Commissioner

(Specify: Ms., Miss, Mrs., Dr., Mr., Other)

I have reviewed the information in this application and certify to the best of my knowledge that the district meets the provisions above.

(Nominating Authority's Signature)

Date 8/13/13

The nomination package, including the signed certifications and documentation of evaluation in the three Pillars should be converted to a PDF file and emailed to green.ribbon.schools@ed.gov according to the instructions in the Nominee Submission Procedure.

OMB Control Number: 1860-0509

Expiration Date: February 28, 2015

Public Burden Statement

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless such collection displays a valid OMB control number. The valid OMB control number for this information collection is 1860-0509. Public reporting burden for this collection of information is estimated to average 37 hours per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The obligation to respond to this collection is required to obtain or retain benefit P.L. 107-110, Sec. 501, Innovative Programs and



Parental Choice Provisions. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Department of Education, 400 Maryland Ave., SW, Washington, DC 20202-4536 or email ICDocketMgr@ed.gov and reference the OMB Control Number 1860-0509. Note: Please do not return the completed ED-Green Ribbon Schools application to this address.



ED-GRS *District* Nominating Authority Application

ACTON-BOXBOROUGH REGIONAL SCHOOL DISTRICT & ACTON PUBLIC SCHOOLS (ABRSD-APS)

Number of Schools at each level and enrollment 5 Elementary (PK-5) enrollment : 2,514 1 Middle (6-8) enrollment: 955 1 High (9-12) enrollment: 1,955 *see note about Colebrook HS below	How would you describe your district: <input type="radio"/> Urban <input checked="" type="radio"/> Suburban <input type="radio"/> Rural	District Name: Acton-Boxborough Regional School District & Acton Public Schools Largest 50 Districts? No Total enrolled: 5,424
Does your district serve 40% or more students from disadvantaged households? <input type="radio"/> Yes <input checked="" type="radio"/> No	% receiving FRPL: 4.0% % limited English proficient: 2.5%	Graduation rate: 95.1% Attendance rate: 96.7%

District Contact Information:

District Name: ACTON-BOXBOROUGH REGIONAL SCHOOL DISTRICT & ACTON PUBLIC SCHOOLS (ABRSD-APS)

Street Address: 16 CHARTER ROAD City: ACTON State: MA Zip: 01720

Website (if applicable): <http://ab.mec.edu/>

Superintendent Name: Dr. Stephen Mills

Superintendent Email Address: smills@abschools.org Phone Number: 978-264-4700

Lead Applicant Name (if different): Kate Crosby, Energy Advisor

Lead Applicant Email: kcrosby@abschools.org Phone Number: cell 978-580-0052

Additional Information:

The Acton-Boxborough Regional School District (serving Grades 7-12) and the Acton Public Schools (serving PK-6) are two districts that work in close partnership and are referenced in this application as a single entity (ABRSD-APS). The Green Ribbon Schools application is submitted jointly on behalf of both organizations.

ABRSD-APS schools:

- Acton-Boxborough Regional High School
- R.J. Gray Junior High School
- Conant Elementary School
- Gates Elementary School
- Douglas Elementary School
- Merriam Elementary School
- McCarthy-Towne Elementary School

Colebrook High School (enrollment 30) is located on the central ABRSD-APS campus and is also referenced in the application. Colebrook HS is part of the Concord Area Special Education Collaborative (CASE) and serves students with behavioral, social and/or emotional difficulties.

Application Outline:

1. Are any of your schools or the district participating in a local, state or national school program which asks you to benchmark progress in some fashion in any or all of the Pillars? (X) Yes () No

BENCHMARK PROGRAM	LEVEL	SCHOOL
EPA Portfolio Manager	Energy Star certification (4 applications in process, expected shortly)	Acton-Boxborough RHS McCarthy-Towne ES Merriam ES Douglas ES Conant ES
DOER Green Communities	Green Communities certification, 20% energy reduction commitment	District participating as a whole with the Town of Acton
USDA Healthier US Schools Challenge	Silver Level (notification received, final certification expected shortly)	Gates ES
USDA Healthier US Schools Challenge	Bronze Level (notification received, final certification expected shortly)	Merriam ES McCarthy-Towne ES Conant ES Douglas ES

2. Have your district, schools, staff or student body received any awards for facilities, health or environment?
(X) Yes () No

AWARDS	ORGANIZATION	SCHOOL	YEAR
Green Flag	Eco-Schools USA (National Wildlife Federation)	Acton-Boxborough Regional HS	2012
National Rookie of the Year for the Power Down Project	National Energy Education Development Project	Acton-Boxborough Regional HS	2012
Excellence in Energy and Environmental Education – First Honors level	Massachusetts Executive Office of Energy & Environmental Affairs	Acton-Boxborough Regional HS	2012
Silver Award for K-12 programs	MassRecycle	Acton-Boxborough Regional HS	2012

3. Has your district constructed or renovated building(s) in the past ten years? (X) Yes () No
(1) Number of schools

For renovated building(s):

Acton-Boxborough Regional High School was renovated starting in 2000. A new wing (80,000 square feet) was completed in the summer of 2002. The rest of the building was then renovated (300,000 sq. ft.), which was completed in late 2004. The project contained components that exceeded the energy code at that time and others that met the energy code. No green building certification was sought.

Percentage of the building area that meets green building standards: All systems either met or exceeded energy code.

Certification and level: None sought.

Total renovated area: 300,000 square feet renovated with 80,000 square foot new addition

PILLAR I: REDUCED ENVIRONMENTAL IMPACT AND COSTS

ENERGY

ENERGY CONSUMPTION ABRSD-APS	Electricity		Natural Gas		Ultra-Low Sulfur Diesel		TOTAL	
	mmBtu	CO2 (metric tons)	mmBtu	CO2 (metric tons)	mmBtu	CO2 (metric tons)	TOTAL mmBtu	TOTAL CO2 (metric tons)
TOTAL mmBtu FY2008-2009	27,662	3,329	44,794	2,464	6,899	70	79,355	5,863
TOTAL mmBtu FY2011-2012	22,663	2,728	32,325	1,778	6,827	70	61,815	4,575
CO2 deduction for on-site electricity production in 3 solar arrays (total of 1,105 mmBtu)							1,105	-133
GRAND TOTAL for CO2								4,442
REDUCTIONS OVER 3 YEARS	-18.1%	-18.1%	-27.8%	-27.8%	-1.0%	-1.0%	-22.1%	-24.2%

Over the last three years, since establishing a Portfolio Manager benchmark year in FY2009 as part of participating in the DOER Green Communities program, ABRSD-APS has achieved:

- 22.1% reduction in total energy consumption over three years
- 18% reduction in total electricity consumption over three years, including:
 - a strong and successful emphasis on a behavior change approach including engagement by students, staff and faculty at all levels of the district
 - mechanical projects including lighting retrofits and upgrades to walk-in coolers
- 24.2% reduction in CO2 emissions over three years (reduction now growing significantly due to commitment to district-wide contract to purchase 20% green electricity as of 12.1.12 – see bullet below)
- Committed to purchasing 20% of district electricity load from renewable sources as part of new contract with district supplier (Suez) beginning 12.1.12
- Installed 280 kW of solar photovoltaic arrays (on three school roofs), which supply 4.9% of the district's total electricity consumption
- Established an Energy Advisor position funded initially with Green Communities grant money, now funded as full-time district staff
- Active student groups at all levels who participate in fostering a culture of energy conservation within our schools: Power Down – Resource Force team at ABRHS, Climate Club at RJ Grey, Energy Detectives at the elementary level. Student groups contribute momentum, creativity and in some cases significant leadership on energy conservation and other sustainability issues.
- Ongoing aggressive pursuit of energy savings, including \$141,498 awarded through a recent competitive round of Green Communities funding for weatherization and HVAC projects
- Recently completed a Whole Building Assessment of ABRHS, identifying Energy Conservation Measures predicted to result in an additional 19% cut in electricity and 30% cut in natural gas
- Installed new condensing boilers at three elementary schools
- Qualified for Energy Star plaques for four out of six school buildings (encompassing five schools) – applications are in process and certification is expected shortly

WATER and GROUNDS

- Water usage (gallons/year) cut by 20% following installation of new low-flow plumbing fixtures throughout every school building in 1998

- Local tap water promoted as sustainable alternative to bottled water through student-designed poster campaign and installation of bottle-filling stations in all schools
- Domestic water supplied by Acton Water District, managed with rigorous testing regimen
- Random water samples collected by district staff and tested for lead and other heavy metals in cooperation with Acton Water District
- Plumbing system in each building checked thoroughly 2x/year by district plumber for potential leaks. Facilities staff are paid to perform daily visual inspections to check for moisture and water intrusion; checks are scheduled in unoccupied buildings during holidays and weekends as well.
- Taps, faucet and fountains cleaned daily; faucet screens and aerators emptied & cleaned 2x/year by district plumber
- Irrigation of grounds is limited in scope and performed infrequently, and is drawn from non-potable local well on site
- Two large-scale rain gardens planted in 2012 to manage stormwater runoff: one by student team at base of long slope, one by Facilities below new parking lot. Both emphasize native species
- 100% of landscaping is water-efficient and regionally appropriate
- 25% of school grounds is forested; wildlife habitat in forested and edge environments

WASTE, HAZARDOUS WASTE

	Solid Waste (tons)	Paper recycling (tons)	Single Stream (tons)	Organics (tons)	Total (tons)	Solid waste as % of total
FY2008	600	40			640	94%
FY2012	434		161	25	620	70%

- Single stream recycling introduced in all schools in September, 2010, which led to 24% drop in solid waste (see chart)
- Student-led "Trash Party" audit of lunch waste at HS in November, 2011 - identified tremendous potential to cut solid waste in cafeteria. Student-led reorganization of HS cafeteria in March, 2012 with new student-staffed sorting stations has resulted in drop in cafeteria solid waste stream from 80% to 24% of total, with 100% capture of recyclables and new introduction of organics diverted for composting. Students now researching paper goods procurement issues for Food Services Director.
- Active student teams responsible for collection of recyclables in all district schools
- Kitchens throughout district now capturing recyclables; organics captured in some kitchens with all targeted
- All workstations and desktops purchased by the district IT Department meet EPEAT standards (from FY2011 forward)
- All toilet paper and paper towels purchased by the district are Green Seal Certified, made with 100% recovered material and 25% minimum post-consumer material.
- Custodial cleaning simplified to three products (all-purpose cleaner, disinfectant, glass cleaner) – all are certified as green through MA Operational Services Division
- Green cleaning practices: Floor stripping eliminated – floors managed now through spot treatments with cold-scrubbing – and therefore discontinued the annual use of ~1,000 gallons of chemical wax stripper.
- HS chemistry teachers have attended Green Chemistry classes and minimize the use of hazardous chemicals in lab. No hazardous waste generated in schools other than HS science labs which are equipped with well-functioning hoods and an acid neutralizer tank for handling disposal.
- Used fluorescent lamps are properly recycled for recapture of mercury

TRANSPORTATION

- Policy in place requiring all district vehicle purchases meet high fuel efficiency standards
- Bus fleet - all vehicles are 2012 models:
 - fueled with ultra-low sulfur diesel
 - equipped with clean Selective Catalytic Reduction (SCR) technology
 - shut-off mechanism enforces no idling beyond 5 minutes
- District "No idling" procedure in place and publicized
- Vehicle loading/unloading areas > than 25 feet from air intakes, doors, windows (with exception of single area at RJ Grey JHS – transportation staff are working to address this by staggering bus line-up and communicating with vendors)
- Walking School Bus program (Safe Routes to Schools) active at two elementary schools (Douglas ES, Merriam ES); administrative support mobilizing to expand this to other schools
- Mini-grant from Safe Routes to School funded boardwalk over brook and marsh as pedestrian linkage between two elementary schools
- Public van service funded with town support provides after-school transportation option:
www.minutevan.net/

PILLAR 2: IMPROVE THE HEALTH AND WELLNESS OF STUDENTS AND STAFF

IPM: The district maintains a fundamental belief that pest prevention and monitoring is the best form of IPM. Therefore the IPM coordinator focuses on communicating with building-based facility professionals about prevention techniques and continuous monitoring in an attempt to stop pests before they become a problem, eliminating the need for pesticides all together. Annually the IPM coordinator will propose capital projects focused on mitigating exposure to unwanted pests. These projects may range from small projects such as replacing door sweeps to larger projects such as repointing masonry walls to avoid stinging insect infestation. In compliance with the Children and Families Protection Act, the district maintains detailed Integrated Pest Management plans with the Massachusetts Department of Agricultural Resources (MDAR). It is the philosophy and practice of the district to implement Integrated Pest Management procedures to control structural and landscape pests and minimize exposure to children, faculty, and staff to pesticides. The district IPM coordinator maintains an IPM committee at each property, and keeps our plans accessible online at www.massnrc.org for public viewing.

With regards to overall district oversight, as mentioned we have on staff a licensed IPM Coordinator and both of our district groundsman maintain pesticide licenses through the UMass Extension Pesticide Licensing Program. The district also contracts with a licensed industry professional on an as-needed basis to provide oversight and technical guidance.

CONTAMINANT CONTROLS: CO monitors are installed and monitored at all locations where gas-burning appliances are in use. Radon testing was completed in Parker Damon Building, the Junior High and ABRHS when these buildings finished renovation or construction. Smoking is prohibited throughout the entire campus and this is rigorously enforced. There is no chromate copper arsenate –treated wood on our school grounds.

ASTHMA CONTROL: Each student in the district with an asthma diagnosis has an individual asthma plan created in cooperation with pediatrician, parent and school nurse. Triggers are identified, and prevention and treatment plans are developed. In addition, possible triggers such as bus fumes, latex and mold are controlled through our other management practices.

INDOOR AIR QUALITY: We maintain ASHRAE IAQ standards, including monitoring for CO₂, ventilation rates, relative humidity, air velocity and temperature. If any IAQ concern arises, testing is pursued immediately through obtaining a sample using a sterile sampling cassette. The cassette is sealed and transferred to a microbiology laboratory for analysis, including mold spores. Filters are changed in equipment quarterly, and unit ventilators are vacuumed and cleaned annually. Our district HVAC specialist monitors parameters, performance and quality control in all our buildings daily.

MOISTURE CONTROL: Facilities staff members are paid to perform daily visual inspections to check for moisture and water intrusion. On weekends and holidays, while buildings are unoccupied, staff members are paid to do “building checks” to inspect for water intrusion, any HVAC anomalies and security. Our focus is on prevention. We perform air testing for mold immediately in any area of concern (see IAQ above).

CHEMICAL MANAGEMENT: The Acton-Boxborough Regional High School is the only school building in the district that has science labs equipped with chemicals for experimentation. As a result, the HS is equipped with a pH Neutralization System which is used to neutralize an acid or base that may be a byproduct of the lab experiments. The pH system is inspected quarterly as part of a service agreement maintained by the school and a local vendor. All drain lines in the laboratories are piped to this system, which prevents any hazardous waste from accidentally ending up in the local sewer system. Custodial cleaning has been simplified to three products (all-purpose cleaner, disinfectant, glass cleaner) – all are certified as green through the MA Operational Services Division.

NUTRITION & FITNESS

Our district promotes nutrition, physical activity and overall school health. We have just received word of certification through the USDA's Healthier US School Challenge for Gates Elementary School at the Silver level, and for the other four elementary schools at the Bronze level.

Our district purchases local produce when it is available. We participate in the Mass. Harvest Week each fall as well as the Farm to School Program. We have an annual tradition to purchase corn on the cob from local farms and invite the children to husk the corn during the Mass Harvest Week. The farm fresh corn is on the menu the day the students husk the corn, and students are very excited for lunch that day.

We have a few gardens on the campus. There are gardens at Acton-Boxborough Regional High School, Gates Elementary School and at Colebrook High School, as well as a hydroponic garden in the High School. Monty Grob, a 5th grade teacher at Gates writes about what the school garden does for their school:

*The Gates Garden began as a fifth grade project in 2009 and expanded to include 2nd and 3rd grades, Art class, Gates' cafeteria, staff, and the neighborhood. I originally wanted to my students an experience of growing vegetables and flowers from seed to harvest. Along with Mrs. Sheryl Kokkinos (3rd. grade teacher) we attended workshops sponsored by **Massachusetts Agriculture in the Classroom**. On these Saturdays we learned about finding support and resources for school gardens, guidelines for food standards acceptable by the Dept. of Agriculture, organic gardening processes, composting, traditional colonial vegetables, and raised beds gardening. Second graders help with planting and harvesting, use math to measure 13 ' sunflowers, and estimate numbers of sunflower seeds. Third graders plant a colonial section of corn, squash, and beans. Fifth graders start seedlings, plant, and harvest. Fifth graders also do a math project involving area and volume. Gates' art teacher uses flowers from the garden in her fall lessons. The cafeteria gratefully accepts our harvest: tomatoes, carrots, lettuce, pumpkins, and corn. Staff, neighbors, and parents use the garden during the summer and have very kindly commented on how beautiful it looks. The garden has been a valuable resource for instruction, conservation, and pure enjoyment.*

We compost food scraps from the kitchen at Gates School, and from both the cafeteria and kitchen at the High School.

One of our Cafeteria Managers hosts a Local Cooking Class during the summer. She meets students at the Acton Farmer's Market and provides them with a list of items they will need for the cooking class for the week. They go back to the High School with local produce and start creating recipes. The students love this class!

The Food Service Director visits K-8 classes, giving students an opportunity to plan a menu for their whole school for a day. They discuss purchasing, the 5 components of a meal, menu requirements, what the students like to eat, etc. This is a great way to get feedback from the students away from the busy cafeteria setting.

Health measures are integrated into physical education assessments, such as the target heart rates, heart rate monitors, pacer tests, and the President's Fitness and Fitnessgram measurements for cardio fitness.

Students spend an average of 25-40% of their physical education time outdoors over the course of a year.

Grade	Physical Education (avg. minutes/wk)	Recess (avg. minutes/wk)	Total Physical Ed. & outdoor recreation (avg. minutes/wk)
K-6	60	150	210
7 thru 8	112.5	0	112.5
9	118	0	118
10 thru 12	59	0	59

PILLAR 3: EFFECTIVE ENVIRONMENTAL AND SUSTAINABILITY EDUCATION

CURRICULUM IN ENVIRONMENTAL ISSUES/ SUSTAINABILITY HAPPENS IN EVERY SCHOOL IN THE DISTRICT

Earth Science: environmental issues & sustainability are central themes woven into most of what is studied, i.e.:

- When studying rock/mineral resources, recycling and conservation are discussed. Classes consider how what we consume affects areas rich in mineral resources (i.e. conflict minerals in Congo)
- Water and soil are studied from many perspectives; as renewable resources on which life is dependent
- Alternative sources of energy are studied and debated, leading to a unit on Climate Change. Students develop a culminating project.

English: several environment themes examined through literature:

- Ills that come with industrialization: *The World Is Too Much With Us* and *Lines Composed a Few Miles above Tintern Abbey* (Wordsworth);
- Environmental Impact: *The Whole Fracking Enchilada*, (Steingraber), *The Spill Seekers*, (Jacobson); *Fish out of Water*, (Dolin) *Emptying the Skies* (Franzen)

World Languages: students study environmental issues based on grammar and vocabulary. Students practice speaking, listening, reading and writing based on this theme and do a culminating research project on an environmental issue of their choice. They create a public service announcement.

Mathematics: Statistics class uses environmental issues for real-world applications of statistics themes... oil spills & streams for data analysis; El Nino for linear regressions; energy for randomness/probability; pregnancy, rainfall, museum membership, milk for distribution models; birth weight for comparing two proportions; gasoline and braking for paired samples and blocks; acid rain, el Niño, and ozone for regression.

Social Studies: US History course includes a study of the conservation movement in the Progressive Era (Muir, Pinchot, TR--the damming of Hetch Hetchy Valley and the National Parks movement); the Dust Bowl in the 1930s; the Environmental Movement in the postwar world (Rachel Carson, Love Canal, Cuyahoga River Fires, Three Mile Island, Earth Day; the effect of postwar consumerism on the environment; and the federalization of environmental regulation under Nixon).

Visual Arts: Environmental themes are incorporated in a variety of ways. For example, students in Drawing and Painting classes designed "Power Down" switch plate frames that are in use with light switches in all classrooms throughout the school. Students applied recently learned concepts of color theory to these switch plate frame designs to call attention to the green initiative to turn off lights when rooms are not in use.

Colebrook High School (Alternative HS serving students with behavioral/social/emotional difficulties) Students planned and developed an organic garden, growing vegetables and flowers. Vegetables and flowers were sold at six summer "Farmer's Markets" held in the school lobby. Profits from sales were reinvested in the garden costs. The food grown was also used for lunches during the CHS summer and fall programs and lunches. Fall culinary classes harvested basil, made pesto, and froze it for a winter school lunch. The pre-school summer session children, located in the same school building, helped to pick vegetables.

Curriculum connections included planning for, purchasing and installing the garden beds, designing and constructing a trellis of natural materials for flowering vines as a visual focal point for the garden. Students also studied composting and soils and watched "Dirt! The Movie" (a 2009 American documentary film which was inspired by the book *Dirt: The Ecstatic Skin of the Earth* by William Bryant Logan). The film explores the relationship between humans and soil, including its necessity for human life and impacts by society.

Element 3A: Interdisciplinary

Element 3B: Use of Environment

Element 3C: Civic Engagement

AP Environmental Science: Sustainability is the underlying theme for this entire course. The course is the most interdisciplinary of the sciences, focusing on building understanding of environmental issues. Students first learn about the biology, earth science, and chemistry needed to understand how the Earth's systems function and then delve into a variety of sustainability issues. These include population growth, energy, resource use (water, soils, minerals), land use, agriculture, waste (solid and hazardous), pollution (air and water), and climate change.

- Percentage of last year's eligible graduates who completed the AP Environmental Science course during their high school career: 12.5% (based on 61 students out of graduating class of ~488)
- Percentage scoring a 3 or higher: 98.4%
- Students plan and run an annual Energy Fair for sixth grade classes at which students participate in energy and conservation/environmental themed activities.
- Term project descriptions can be found at: <http://ab.mec.edu/abrhs/science/hohn/apes/termprojects.html>

<i>Element 3A: Interdisciplinary</i>	<i>Element 3B: Use of Environment</i>	<i>Element 3C: Civic Engagement</i>
--------------------------------------	---------------------------------------	-------------------------------------

Elementary Schools:

- Sixth graders study Energy Resources, learning about energy transfer (source to receiver); power generation from fossil fuels and alternative sources; and the importance of energy conservation. Current plans include expanding this study to include climate and climate change as the science standards are updated.
- Fifth graders study ecosystems, analyzing relationships among biotic and abiotic factors, culminating in a "mock town meeting", modeling factors influencing the health of the Chesapeake Bay, sometimes using a local trash issue, again using multiple perspectives. (Schools received a "Living Democracy" Service Learning grant to support this inter-disciplinary project.) The problem of invasive species is introduced in the ecosystem study.
- Third graders study soils and composting, creating classroom habitats for composting worms.
- Second graders learn about vernal pools and observe the development of wood frog eggs into tadpoles (with permission of the town's Conservation administrator.) Threats to habitat are discussed.
- Pre-school, Kindergarten and first grade classes have a focus on learning about life science by studying their schoolyard animals. Nature Walks and seasonal scavenger hunts are common.
- All schools participate in the district-wide recycling and "Power Down" initiatives.
- Many schools have developed garden plots and are incorporating the work into their curriculums (some previously mentioned). Students at Merriam School participated in a children's garden project with one of the Town of Acton's community garden sites. One class planted a "circular pizza garden" which they later harvested and used to make pizzas. Another Merriam School program involved many students starting seedlings for a local farm serving food to the needy.
- All schools have access to natural outdoor areas and have developed natural history curricula, often supported by parent volunteers. Our central school campus has an outdoor classroom that is shared by five schools. Students at Conant and Merriam Schools participate in semi-annual clean up days for trash and weed removal, with an eye toward partial control of invasive species.

<i>Element 3A: Interdisciplinary</i>	<i>Element 3B: Use of Environment</i>	<i>Element 3C: Civic Engagement</i>
--------------------------------------	---------------------------------------	-------------------------------------

CURRICULUM INITIATIVES

Sharing Biodiversity and Culture- an international collaboration between one classroom in Acton and one in Ilobasco, El Salvador. Students worked for a year studying and sharing the biodiversity of their schoolyards. The project was a partnership with The Discovery Museums in Acton, MA in a grant-funded program. The year-long program involved a teacher exchange, with several Acton teachers traveling to El Salvador with staff from the Discovery Museums, followed later in the project by a visit to Acton from teachers and museum staff from El Salvador. That first meeting was used to plan out the collaborative efforts and to introduce participants to one another. Students in both schools were assigned penpals, used video conferencing and exchanged art and biodiversity projects. The exchange culminated in mosaic projects in both schools which are now permanently displayed. See discoverymuseums.org/programs-events/teaming-el-salvador

"Discover STEM" biennial event - This volunteer-led "reverse science fair" introduces junior high and high school students to exciting STEM programs, including energy and green technology related careers and innovations. More information at www.actonpip.org/discoverstem.htm

<i>Element 3A: Interdisciplinary</i>	<i>Element 3B: Use of Environment</i>	<i>Element 3C: Civic Engagement</i>
--------------------------------------	---------------------------------------	-------------------------------------

PROFESSIONAL DEVELOPMENT

The district supports a robust Professional Learning Program, allocating resources allowing teachers to participate in a wide variety of graduate level courses that support the teaching of environmental issues and sustainability. One such opportunity is participation in a multi-year, multi-district environmental science institute, offered by the EDCO Collaborative. Our first participant (2012), Katherine Shiebler (grade 3-4 teacher at Merriam School) had an opportunity to pursue a self-selected environmental education opportunity in the rainforest in Central America. Kate speaks of this opportunity as one of the most powerful in her educational career. She has been able to bring her new understandings of the environment into her third graders' study of soil habitats this year.

Adult Nature Study opportunities include book study groups and opportunities to explore the outdoors in Professional Learning settings. Groups of teachers and parents read the books *Last Child in the Woods* (Richard Louv), and *Keeping a Nature Journal* by Clare Walker Leslie. They participated in several outdoor activities, modeling approaches that could be used with students. At the parent discussion group, local artist/naturalist Clare Walker Leslie spoke on nature journaling as a strategy for connecting with nature in a powerful way.

Teachers have opportunities to visit local conservation lands with the Town's Natural Resource Director, providing an opportunity to personally experience the "connections" Louv discusses in his book.

Approximately 20 early childhood educators participated in a Saturday morning *Growing up Wild* workshop in the spring of 2012. More at www.projectwild.org/GrowingUpWILD.htm

<i>Element 3A: Interdisciplinary</i>	<i>Element 3B: Use of Environment</i>	<i>Element 3C: Civic Engagement</i>
--------------------------------------	---------------------------------------	-------------------------------------

ADDITIONAL INFORMATION ABOUT SUSTAINABILITY INITIATIVES AT ABRSD-APS:

Massachusetts DOER case study of ABRSD-APS Power Down Project:

<http://www.mass.gov/eea/docs/doer/green-communities/pubs-reports/gc-case-study-acton-boxborough.pdf>

ABRHS Resource Force Sustainability website maintained by students and Energy Advisor:

<sites.google.com/a/abschools.org/sustainabilityabrhs/powerdownproject>

<sites.google.com/a/abschools.org/sustainabilityabrhs/resource-stream/cafeteria-project>

National Wildlife Federation blog about student empowerment in advancing sustainability agenda in Acton:

<blog.nwf.org/2012/05/student-leaders-in-the-making-at-second-massachusetts-green-flag-eco-school/>

Patch News video about the dumpster-diving "Trash Party" audit with Senator James Eldridge in attendance:

<acton.patch.com/articles/video-acton-boxborough-students-dumpster-dive-for-a-green-cause#video-8584376>

Patch News video about dramatic results with student-led reorganization of cafeteria to capture 100% of recyclables and initiate capture of organics:

<acton.patch.com/articles/video-acton-boxborough-students-green-their-cafe#video-9424923>

Patch News video about the international Green Flag awarded to ABRHS:

<acton.patch.com/articles/video-abrhs-receives-green-flag-award#v>

Acton *Beacon* article about sustainability at ABRHS:

<www.wickedlocal.com/acton/news/x1310212493/ABRHS-wins-Green-Flag-award - axzz2F2VV5qIP>

Green Flag Award celebration at ABRHS:

<www.vzaar.com/videos/1137172>

Sharing Biodiversity and Culture - Teaming up with El Salvador through the Discovery Museums in Acton:

<www.discoverymuseums.org/programs-events/teaming-el-salvador>

AB PIP STEM, the parent advocacy/support group for STEM activities in the district, sponsors a wide variety of science and "green"-related activities held outside of schools hours. These events are often staffed by high school volunteers under the supervision of adult AB PIP STEM members. The *Discover STEM* "reverse science fair" was previously referenced.

www.actonpip.org/

Growing Up Wild Teacher Professional Development program for children ages 3-7 was organized in cooperation with Mass Wildlife.

www.mass.gov/dfwele/dfw/education/wild/growing_up_wild

Friends of Pine Hawk is a local organization formed in 2005 following an archaeological excavation during a sewer project. Significant artifacts were discovered, replicated and are available for students through our partnership with this organization.

www.actonmemoriallibrary.org/pinehawk/default.htm

The Boston Globe

PEOPLE & PLACES

By Cindy Cantrell | GLOBE CORRESPONDENT JUNE 17, 2012

GOING GREEN

Acton-Boxborough Regional High School has scored a trifecta of international, national, and state awards for efforts to go green.

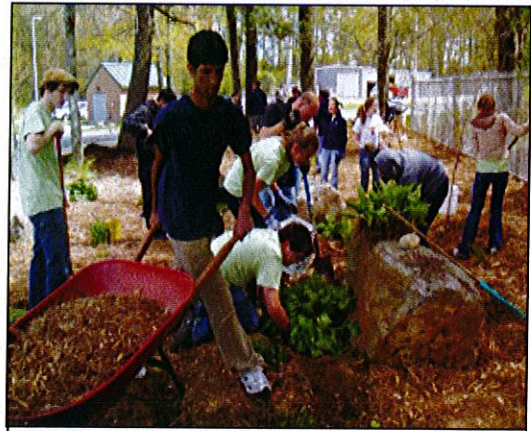
Last month, Acton-Boxborough became just the fourth school in the United States to win the Eco-Schools Green Flag Award from the National Wildlife Federation. The green flag, which signifies the school's inclusion in the Green Flag network adopted by 40,000 schools in 50 countries, now flies alongside the US and state flags at the school entrance.

At the State House, the school was presented with "First Honors" for the Secretary's Award for Excellence in Energy and Environmental Education. On Friday, eight students and two faculty members will travel to Washington, D.C., to accept the National Senior Level Rookie of the Year award from the National Energy Education Development Project for Acton-Boxborough's Power Down Project.

According to Kate Crosby, Energy Advisor for the Acton Public Schools/Acton-Boxborough Regional School District, student leadership has driven sustainability initiatives. Results include 10 percent less electricity consumption at the high school over the past year and a half, a 250 percent increase in recycling at the cafeteria, the installation of a vermicomposting worm bin and 500-square-foot rain garden, and the promotion of water bottle refilling stations located throughout the school.

"I'm extraordinarily proud," Crosby said, noting that credit goes to all cooperating students, faculty, and staff. "It has been tremendously exciting to oversee these efforts, which have resulted in cost savings for the district, a smaller environmental footprint, and immense leadership opportunities for students who have succeeded in creating a shift in culture within their school."

www.bostonglobe.com/metro/regionals/west/2012/06/16/year-old-credits-learning-prep-school-with-graduation/wsSLbyLC8cStO8S1hwWHvK/story.html

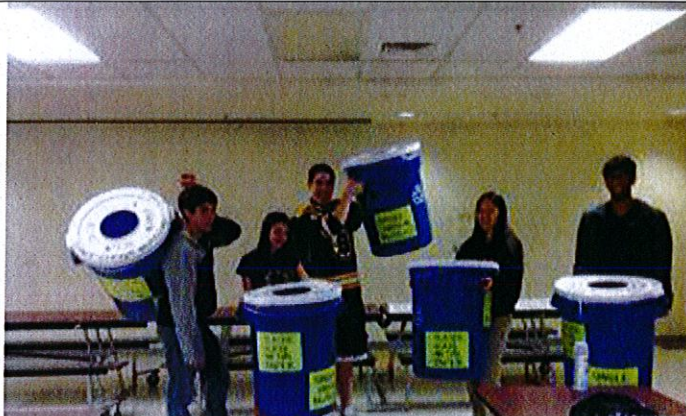


Students at Acton-Boxborough High School plant a rain garden as part of the school's state, national, and internationally recognized efforts to go green.

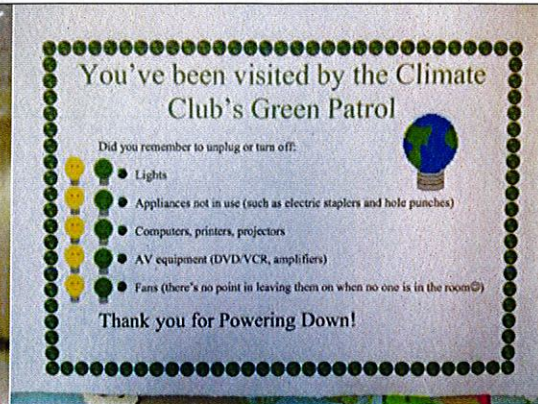
ENERGY CONSUMPTION - ABRSD/APS										
FY 2008-2009										
	Electricity		Natural Gas			Ultra-Low Sulfur Diesel		TOTAL		
	mmBtu	kWh	CO2 (metric tons)	mmBtu	therm	CO2 (metric tons)	mmBtu	CO2 (metric tons)	TOTAL mmBtu	TOTAL CO2 (metric tons)
ABRHS	13,252	3,884,161	1,595	15,174	151,740	835			28,426	2,429
RJ Grey JHS	3,592	1,052,815	432	11,185	111,850	615			14,777	1,047
PDB	5,508	1,614,395	663	5,135	51,350	282			10,643	945
Admin Bldg	1,581	463,391	190	4,015	40,150	221			5,596	411
Maint Shed	96	28,138	12		0	0			96	12
Conant	1,324	388,064	159	3,314	33,140	182			4,638	342
Gates	1,128	330,617	136	3,536	35,360	194			4,664	330
Douglas Buses	1,181	346,151	142	2,435	24,350	134			3,616	276
TOTAL	27,662	8,107,732	3,329	44,794	447,940	2,464	6,899	70	6,899	70
									79,355	5,863
FY 2011-2012										
	Electricity		Natural Gas			Ultra-Low Sulfur Diesel		TOTAL		
	mmBtu	kWh	CO2 (metric tons)	mmBtu	therm	CO2 (metric tons)	mmBtu	CO2 (metric tons)	TOTAL mmBtu	TOTAL CO2 (metric tons)
ABRHS	9,197	2,695,641	1,107	12,531	125,310	689			21,728	1,796
RJ Grey JHS	3,650	1,069,815	439	7,680	76,800	422			11,330	862
PDB	3,073	900,696	370	3,048	30,480	168			6,121	537
Admin Bldg	670	196,377	81	2,106	21,060	116			2,776	196
Maint Shed	3,013	883,110	363		0	0			3,013	363
Conant	1,040	304,824	125	2,324	23,240	128			3,364	253
Gates	1,015	297,497	122	3,018	30,180	166			4,033	288
Douglas Buses	1,005	294,566	121	1,618	16,180	89			2,623	210
TOTAL	22,663	6,642,525	2,728	32,325	323,250	1,778	6,827	70	6,827	70
CO2 deduction for on-site electricity production in 3 solar arrays (total of 1,105 mmBtu)									61,815	4,575
GRAND TOTAL for CO2									1,105	-133
REDUCTIONS OVER 3 YEARS	-18.1%	-18.1%	-18.1%	-27.8%	-27.8%	-27.8%	-1.0%	-1.0%	-22.1%	-24.2%

CHART SHOWING 22.1% DROP IN ENERGY CONSUMPTION AND 24.2% DROP IN CO2 PRODUCTION OVER 3 YEARS FROM FY2009 BENCHMARK FOR ABRSD-APS

ACTON-BOXBOROUGH REGIONAL SCHOOL DISTRICT & ACTON PUBLIC SCHOOLS



HS Resource Force with new recycle barrels



JH Climate Club in action

AP Environmental Science

Schedules Notes Activities Home Links

Term 1 - What are the threats to local ecosystems?
We will be spending much of the coming year studying issues which face the global environment. In this project, we will learn how some of these issues are being addressed locally and think critically about our options for the future.

Term 2 - How should New England generate electricity?
In Massachusetts, over 90% of our electricity comes from fossil fuels and nuclear power. With growing concerns about a dwindling supply of fossil fuels and political realities, many people think it is time to reconsider how we generate electricity.

Term 3 - What should Fremont do?
Confarm, a large agricultural conglomerate, is seeking to 10,000 acres of farmland adjacent to Fremont. This request is counter to local zoning ordinances and will be discussed at an upcoming meeting at the Fremont Town Hall.

Term 4 - Vernal Pool Project
This project involves the documentation and eventual certification of local vernal pools. This is a long term effort in which you will combine your work with the efforts of past and future students. To view an interactive map of the work we have completed thus far in Boxborough, click [HERE](#).

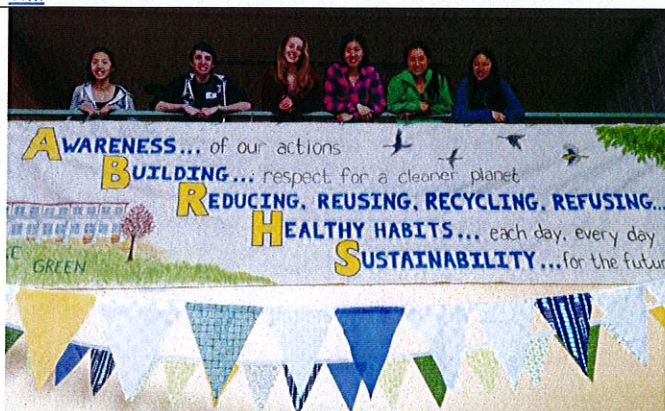
Project Descript
Grading Rub
Project Descript
Grading Rub
Project Descript
Grading Rub
Project Descript
Grading Rub



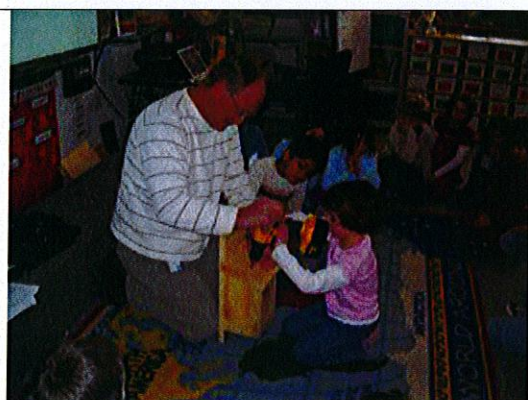
Website for AP Environmental Science

<http://ab.mec.edu/abrhs/science/hohn/apes/termprojects.html>

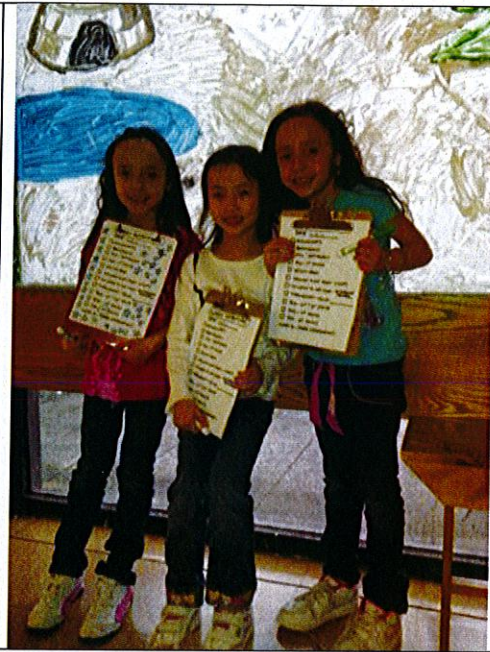
JH Climate Club member getting the word out!



Sustainability Banner in HS lobby



Birdhouse for Conservation Land

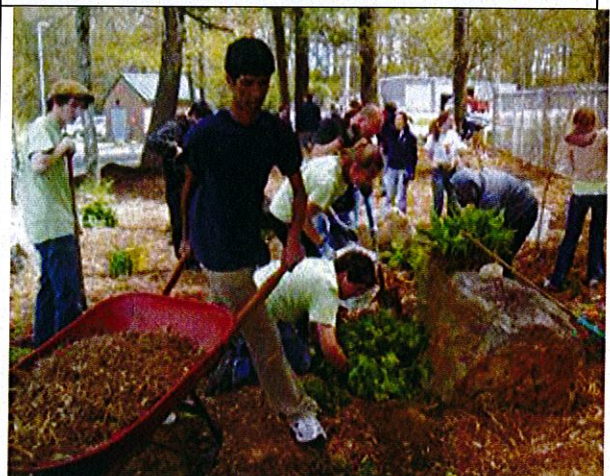


Energy Detectives exploring and assessing in elementary school



Green Flag Award Celebration at ABRHS
(Eco-Schools USA - Nat'l Wildlife Federation)

HS Sculpture I class student project

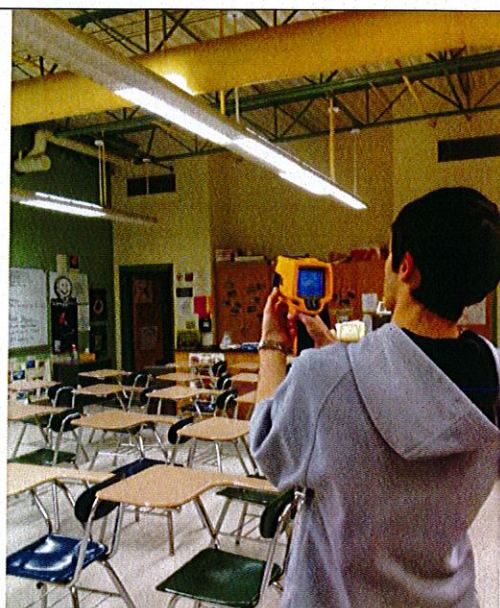


Rain garden built by Facilities Dep't

Rain garden created by HS students



Power Down thumbs-up after classroom check



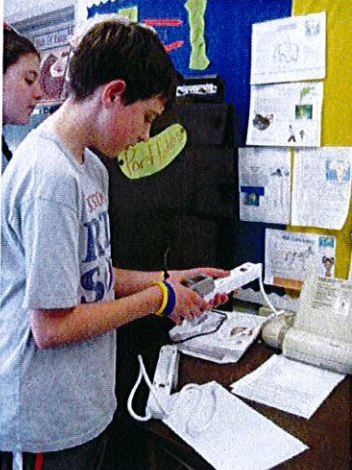
Student use of infrared camera



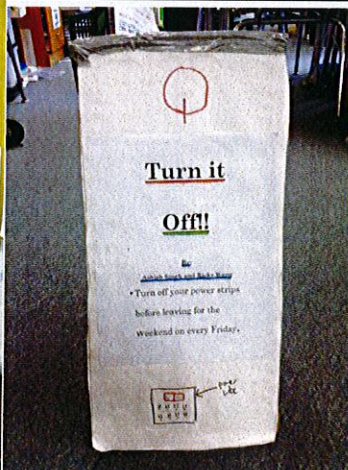
"Down & Dirty Trash Party" audit at HS



Student-run sorting stations in HS caf



Kill-a-Watt meter check
JH Climate Club



Sixth Grade Power
Down



CFL free light bulb exchange at HS